
ARCHIVES OF

**Biochemistry
and Biophysics**

Volume 312, 1994



Academic Press

San Diego New York Boston London Sydney Tokyo Toronto

Copyright © 1994 by Academic Press, Inc.

All Rights Reserved

No part of this publication may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopy, recording, or any information storage and retrieval system, without permission in writing from the copyright owner.

The appearance of the code at the bottom of the first page of an article in this journal indicates the copyright owner's consent that copies of the article may be made for personal or internal use, or for the personal or internal use of specific clients. This consent is given on the condition, however, that the copier pay the stated per copy fee through the Copyright Clearance Center, Inc. (222 Rosewood Drive, Danvers, Massachusetts 01923), for copying beyond that permitted by Sections 107 or 108 of the U. S. Copyright Law. This consent does not extend to other kinds of copying, such as copying for general distribution, for advertising or promotional purposes, for creating new collective works, or for resale. Copy fees for pre-1994 articles are as shown on the article title pages; if no fee code appears on the title page, the copy fee is the same as for current articles.

0003-9861/94 \$6.00

MADE IN THE UNITED STATES OF AMERICA

This journal is printed on acid-free paper.



CONTENTS OF VOLUME 312

Number 1, July 1994

BIOLOGICAL OXIDATIONS AND P450 REACTIONS

- Molecular Modeling and Electrostatic Potential Calculations on Chemically Modified Cu, Zn Superoxide Dismutases from *Bos taurus* and Shark *Prionace glauca*: Role of Lys134 in Electrostatically Steering the Substrate to the Active Site
Fabio Polticelli, Mattia Falconi, Peter O'Neill, Raffaele Petruzelli, Antonio Galtieri, Amalia Lania, Lilia Calabrese, Giuseppe Rotilio, and Alessandro Desideri 22
- Cloning and Sequencing of the Major Rainbow Trout Constitutive Cytochrome P450 (CYP2K1): Identification of a New Cytochrome P450 Gene Subfamily and Its Expression in Mature Rainbow Trout Liver and Trunk Kidney
Donald R. Buhler, Yea-Huey Yang, Theo W. Dreher, Cristobal L. Miranda, and Jun-Lan Wang 45
- The Role of Glucose in Cellular Defences against Cytotoxicity of Hydrogen Peroxide in Chinese Hamster Ovary Cells
Diana A. Averill-Bates and Ewa Przybytkowski 52
- Expression of Modified Human Cytochrome P450 2E1 in *Escherichia coli*, Purification, and Spectral and Catalytic Properties
Elizabeth M. J. Gillam, Zuyu Guo, and F. Peter Guengerich 59
- Different Mechanisms of *tert*-Butyl Hydroperoxide-Induced Lethal Injury in Normal and Tumor Thymocytes
Gianna Maria Bartoli, Elisabetta Piccioni, Giuseppina Agostara, Gabriella Calviello, and Paola Palozza 81
- Different Role of Lipid Peroxidation in Oxidative Stress-Induced Lethal Injury in Normal and Tumor Thymocytes
P. Palozza, G. Agostara, E. Piccioni, and G. M. Bartoli 88
- Lipoic Acid Favors Thiolsulfinate Formation after Hypochlorous Acid Scavenging: A Study with Lipoic Acid Derivatives
Gerreke Ph. Biewenga, Jan de Jong, and Aalt Bast 114
- Role of Vascular Nitric Oxide Synthase in Endotoxin Shock of *Propionibacterium acnes*-Sensitized Rats
Toru Kida, Tetsuo Kuroki, Kenzo Kobayashi, and Masayasu Inoue 135
- Respiratory Chain of the Lung Fluke *Paragonimus westermani*: Facultative Anaerobic Mitochondria
Shinzaburo Takamiya, Hua Wang, Akira Hiraishi, Yong Yu, Fusanori Hamajima, and Takashi Aoki 142
- Antioxidant Potential of Anaerobic Human Plasma: Role of Serum Albumin and Thiols as Scavengers of Carbon Radicals
Marco Soriani, Donatella Pietraforte, and Maurizio Minetti 180
- Macrophage Recognition of Saccharide Chains on the Erythrocytes Damaged by Iron-Catalyzed Oxidation
Masatoshi Beppu, Takuya Takahashi, Masaki Kashiwada, Shinji Masukawa, and Kiyomi Kikugawa 189
- Thiol-Mediated NTA-Fe(III) Reduction and Lipid Peroxidation
Nathan Spear and Steven D. Aust 198
- Growth Hormone-Dependent and -Independent Sexually Dimorphic Regulation of Phenobarbital-Induced Hepatic Cytochromes P450 2B1 and 2B2
Bernard H. Shapiro, Nisar A. Pampori, David P. Lapenson, and David J. Waxman 234
- Mechanism of Prostaglandin E₂ Release and Increase in PGH₂/PGE₂ Isomerase Activity by PDGF: Involvement of Nitric Oxide
Michael J. Kelner and Slavomir F. Ugluk 240
- Singlet Oxygen Chemiluminescence at Gas-Liquid Interfaces: Theoretical Analysis with a One-Dimensional Model of Singlet Oxygen Quenching and Diffusion
Jeffrey R. Kanofsky and Paul D. Sima 244
- Generation of Strand Breaks and Formation of 8-Hydroxy-2'-deoxyguanosine in DNA by a Thiol/Fe³⁺/O₂-Catalyzed Oxidation System
Jeen-Woo Park and Robert A. Floyd 285
- Peroxidase-Catalyzed Oxidation of Azo Dyes: Mechanism of Disperse Yellow 3 Degradation
Jack T. Spadaro and V. Renganathan 301

ENZYME STRUCTURE AND MECHANISMS; CELLULAR REGULATION; PHOSPHORYLATION AND DEPHOSPHORYLATION

- Human Cytoplasmic 3-Hydroxy-3-methylglutaryl Coenzyme A Synthase: Expression, Purification, and Characterization of Recombinant Wild-Type and Cys¹²⁹ Mutant Enzymes
Laura L. Rokosz, David A. Boulton, Elise A. Butkiewicz, Gautam Sanyal, Maria A. Cueto, Paul A. Lachance, and Jeffrey D. Hermes 1

9

12/94 31249-200

813HI

XL

1320



Kinetic Mechanism of Activation of Muscle Glycogen Phosphorylase <i>b</i> by Adenosine 5'-Monophosphate	<i>Sergey V. Klinov and Boris I. Kurganov</i>	14
Rat Liver Arginase: Kinetic Mechanism, Alternate Substrates, and Inhibitors	<i>Robert S. Reczkowski and David E. Ash</i>	31
Protein-Ligand Interactions as a Driving Force for a High-Enthalpy Two-State Transition in Glutamate Dehydrogenase: The Opposing Roles of Phosphate and Acetate Ions	<i>Narinder Singh and Harvey F. Fisher</i>	38
The Bifunctional Cytosolic 5'-Nucleotidase: Regulation of the Phosphotransferase and Nucleotidase Activities	<i>Rossana Pesi, Maura Turriani, Simone Allegrini, Cosima Scolozzi, Marcella Camici, Piero Luigi Ipata, and Maria Grazia Tozzi</i>	75
N ^ω -Phosphoarginine Phosphatase from Rat Renal Microsome was Alkaline Phosphatase	<i>Masaki Nishino, Syunsuke Tsujimura, Masako Kuba, and Akira Kumon</i>	101
Kinetics of Enzymes with Iso-Mechanisms: Dead-End Inhibition of Fumarase and Carbonic Anhydrase II	<i>Karen L. Rebholz and Dexter B. Northrop</i>	227

GLYCOCONJUGATES AND OLIGOSACCHARIDES; PROTEOGLYCANS AND EXTRACELLULAR MATRICES

Tyrosine Derivatization and Preparative Purification of the Sialyl and Asialyl N-Linked Oligosaccharides from Porcine Fibrinogen	<i>M. L. Corradi Da Silva, Toshiaki Tamura, Tamara McBroom, and Kevin G. Rice</i>	151
--	---	-----

LIPIDS, LIPID MEDIATORS, AND GLYCOLIPIDS

Interactions of the Pyrethroid Insecticide Allethrin with Liposomes	<i>María Rosa Moya-Quiles, Encarnación Muñoz-Delgado, and Cecilio J. Vidal</i>	95
A Revised Structure for the Disialosyl Globo-Series Gangliosides of Human Erythrocytes and Chicken Skeletal Muscle	<i>Steven B. Levery, Mary Ellen K. Salyan, Sharon J. Steele, Reiji Kannagi, Somsankar Dasgupta, Jaw-Long Chien, Edward L. Hogan, Herman van Halbeek, and Sen-itiroh Hakomori</i>	125
A Glycoprotein Binding Retinoids and Fatty Acids Is Present in <i>Drosophila</i>	<i>Todd Duncan, Geetha Kutty, Gerald J. Chader, and Barbara Wiggert</i>	158
Identification and Characterization of an <i>Ecto</i> -(lyso)phosphatidic Acid Phosphatase in PAM212 Keratinocytes	<i>Mingsheng Xie and Martin G. Low</i>	254

MEMBRANE PROTEINS AND TRANSPORT; INTRACELLULAR SIGNALS; CYTOKINES AND RECEPTORS

Insulin-like Effects of Sodium Orthovanadate on Diacylglycerol-Protein Kinase C Signaling in BC3H-1 Myocytes	<i>K. Yamada, M. L. Standaert, B. Yu, H. Mischak, D. R. Cooper, and R. V. Farese</i>	167
Separation and Characterization of Two Mg ²⁺ -ATPase Activities from the Human Erythrocyte Membrane	<i>Merran E. Auland, Michael B. Morris, and Basil D. Roufogalis</i>	272
Ca ²⁺ /Calmodulin-Dependent Protein Kinase V: Tissue Distribution and Immunohistochemical Localization in Rat Brain	<i>Tadashi Ito, Hideo Mochizuki, Makoto Kato, Yuji Nimura, Toru Hanai, Nobuteru Usuda, and Hiroyoshi Hidaka</i>	278
Differentiation of Two Classes of "A" System Amino Acid Transporters	<i>Guorong Lin, John I. McCormick, and Rose M. Johnstone</i>	308

PLANT BIOCHEMISTRY AND MOLECULAR BIOLOGY

Kinetic Properties of NAD-Dependent Glyceraldehyde-3-phosphate Dehydrogenase from the Host Fraction of Soybean Root Nodules	<i>Les Copeland and Adrian Zammit</i>	107
Metal Requirements of the Enzymes Catalyzing Conversion of Glutamate to δ -Aminolevulinic Acid in Extracts of <i>Chlorella vulgaris</i> and <i>Synechocystis</i> sp. PCC 6803	<i>Sandra M. Mayer, Siegfried Rieble, and Samuel I. Beale</i>	203

- High Substrate Specificity Factor Ribulose Bisphosphate Carboxylase/Oxygenase from Eukaryotic Marine Algae and Properties of Recombinant Cyanobacterial Rubisco Containing "Algal" Residue Modifications
Betsy A. Read and F. Robert Tabita 210
- Plant Sterol Biosynthesis: Identification of a NADPH Dependent Sterone Reductase Involved in Sterol-4 Demethylation
Sophie Pascal, Maryse Taton, and Alain Rahier 260

PROTEIN STRUCTURE AND FUNCTION; PROTEASES, PROTEIN TURNOVER, AND POST-TRANSLATIONAL PROCESSING

- Inhibitors of Chymotrypsin-like Proteases Inhibit Eosinophil Peroxidase Release from Activated Human Eosinophils
Youichi Matsunaga, Hiroshi Kido, Kouji Kawaji, Keiichi Kamoshita, Nobuhiko Katunuma, and Takeshi Ogura 67
- Identification of the N-Terminal Domain of Enzyme I of the *Escherichia coli* Phosphoenolpyruvate: Sugar Phosphotransferase System Produced by Proteolytic Digestion
Byeong Ryong Lee, Paolo Lecchi, Lewis Pannell, Howard Jaffe, and Alan Peterkofsky 121
- Peptide Mapping of the Subunits and Deglycosylated Polypeptides of Human Liver α -L-Fucosidase
Fariba Shoarinejad, Jill Zhu, Shamideh B. Bazel, and Jack A. Alhadeff 173
- Expression of Porcine Leukocyte 12-Lipoxygenase in a Baculovirus/Insect Cell System and Its Characterization
Ramesh Gala Reddy, Tanihiro Yoshimoto, Shozo Yamamoto, Colin D. Funk, and Lawrence J. Marnett 219
- Biochemical Evidence for the Orientation of Cytochrome b in the Yeast Mitochondrial Membrane in the Eight-Helix Model
Diana S. Beattie, Harvey C. Jenkins, and Marilyn M. Howton 292

Number 2, August 1, 1994

BIOLOGICAL OXIDATIONS AND P450 REACTIONS

- Reversion Mutations in the β Subunit Mutants of *Escherichia coli* F₁-ATPase with Defective Subunit Assembly: Implications for Structure and Function of the Amino-Terminal Region
Junji Miki, Sadamu Tsugumi, and Hiroshi Kanazawa 317
- Effects of Nitroxide Stable Radicals on Juglone Cytotoxicity
Renliang Zhang, Orly Hirsch, Mohammad Mohsen, and Amram Samuni 385
- Expression of Modified Human Cytochrome P450 1A1 in *Escherichia coli*: Effects of 5' Substitution, Stabilization, Purification, Spectral Characterization, and Catalytic Properties
Zuyu Guo, Elizabeth M. J. Gillam, Shigeru Ohmori, Robert H. Tukey, and F. Peter Guengerich 436
- Veratryl Alcohol Oxidase Activity of a Chemically Modified Cellulase Protein
Barbara R. Evans, Ruth Margalit, and Jonathan Woodward 459
- Conversion of Lignin Peroxidase Compound III to Active Enzyme by Cation Radicals
David P. Barr and Steven D. Aust 511
- Human Skin Mitochondrial DNA Deletions Associated with Light Exposure
Cheng-Yoong Pang, Hsin-Chen Lee, Jen-Hung Yang, and Yau-Huei Wei 534
- The High-Level Expression in *Escherichia coli* of the Membrane-Bound Form of Human and Rat Cytochrome b₅ and Studies on Their Mechanism of Function
Priscilla L. Holmans, Manjunath S. Shet, Cheryl A. Martin-Wixtrom, Charles W. Fisher, and Ronald W. Estabrook 554
- Liver Microsome and Flavin-Containing Monooxygenase Catalyzed Oxidation of Organic Selenium Compounds
Guang-Ping Chen and D. M. Ziegler 566

BIOPHYSICAL CHEMISTRY AND X-RAY CRYSTALLOGRAPHY

- P. mevalonii* 3-Hydroxy-3-methylglutaryl-CoA Lyase: Electron Paramagnetic Resonance Investigation of the Copper Binding Site
Chakravarthy Narasimhan, William E. Antholine, and Henry M. Miziorko 467

ENZYME STRUCTURE AND MECHANISMS; CELLULAR REGULATION; PHOSPHORYLATION AND DEPHOSPHORYLATION

- Human Pancreatic-Type and Nonpancreatic-Type Ribonucleases: A Direct Side-by-Side Comparison of Their Catalytic Properties
Salvatore Sorrentino and Massimo Libonati 340
- The Entner–Doudoroff Pathway in *Helicobacter pylori*
George L. Mendz, Stuart L. Hazell, and Brendan P. Burns 349
- Kinetic Properties of Carnitine Palmitoyltransferase I in Cultured Neonatal Rat Cardiac Myocytes
Jeanie B. McMillin, Dachun Wang, Lee A. Witters, and L. Maximilian Buja 375
- Purification and Characterization of Human Brain Ribonuclease Inhibitor
Daita Nadano, Toshihiro Yasuda, Haruo Takeshita, Kiyoshi Uchide, and Koichiro Kishi 421
- Further Characterization by Site-Directed Mutagenesis of the Protein–Protein Interface in the Ferredoxin/Ferredoxin:NADP⁺ Reductase System from *Anabaena*: Requirement of a Negative Charge at Position 94 in Ferredoxin for Rapid Electron Transfer
John K. Hurley, Milagros Medina, Carlos Gomez-Moreno, and G. Tollin 480
- Peptide Substrate Recognition by the Epidermal Growth Factor Receptor
Cheryl A. Guyer, Randall L. Woltjer, Kenneth J. Coker, and James V. Staros 573

GENE EXPRESSION, TRANSCRIPTION, AND TRANSLATION

- Functional Expression and Characterization of the Assimilatory-Type Sulfite Reductase from *Desulfovibrio vulgaris* (Hildenborough)
Jian Tan, Aileen Soriano, Siu Man Lui, and J. A. Cowan 516
- Structural Analysis of Transcripts for the Protein L-Isoaspartyl Methyltransferase Reveals Multiple Transcription Initiation Sites and a Distinct Pattern of Expression in Mouse Testis: Identification of a 5'-Flanking Sequence with Promoter Activity
Aaron Galus, Alexandra Lagos, Elizabeth A. Romanik, and Clare M. O'Connor 524
- Structure of the 5' Flanking Region of Class 3 Aldehyde Dehydrogenase in the Rat
Koichi Takimoto, Ronald Lindahl, Tracy J. Dunn, and Henry C. Pitot 539
- Efflux of RNA from Resealed Nuclear Envelope Ghosts
Detlef Prochnow, Marian Thomson, Heinz C. Schröder, Werner E. G. Müller, and Paul S. Agutter 579

GLYCOCONJUGATES AND OLIGOSACCHARIDES; PROTEOGLYCANS AND EXTRACELLULAR MATRICES

- Measurement of Contribution from Intracellular Cysteine to Sulfate in Phosphoadenosine Phosphosulfate in Rat Ovarian Granulosa Cells
Yumi Imai, Masaki Yanagishita, and Vincent C. Hascall 392

MEMBRANE PROTEINS AND TRANSPORT; INTRACELLULAR SIGNALS; CYTOKINES AND RECEPTORS

- Dexamethasone Blocks the Interferon- γ -Mediated Downregulation of the Macrophage Mannose Receptor
Virginia L. Shepherd, Hanson B. Cowan, Rasul Abdolrasulnia, and Sherell Vick 367
- Isolation and Partial Characterization of Calcium-Activated Chloride Ion Channels from Thylakoids
Vida Vambutas, Hadassah Tamir, and Diana S. Beattie 401
- Intracellular Calcium and pH Alterations Induced by Tri-*n*-butyltin Chloride in Isolated Rainbow Trout Hepatocytes: A Flow Cytometric Analysis
Stéphanie Reader, Harald B. Steen, and Francine Denizeau 407
- Membrane-Associated Carbonic Anhydrase from the Crab Gill: Purification, Characterization, and Comparison with Mammalian CAs
Kirsten Böttcher, Abdul Waheed, and William S. Sly 429
- Heterotrimeric GTP-Binding Proteins (G Proteins) and ADP-Ribosylation Factor (ARF) Regulate Priming of Endosomal Membranes for Fusion
James M. Lenhard, Maria I. Colombo, and Philip D. Stahl 474
- Protein Kinase C Isoforms in Human and Rat Colonic Mucosa
Laurie A. Davidson, Yi-Hai Jiang, James N. Derr, Harold M. Aukema, Joanne R. Lupton, and Robert S. Chapkin 547

PLANT BIOCHEMISTRY AND MOLECULAR BIOLOGY

- Copurification of Cytosolic Fructose-1,6-bisphosphatase and Cytosolic Aldolase from Endosperm of Germinating Castor Oil Seeds
Greg B. G. Moorhead, Richard J. Hodgson, and William C. Plaxton 326
- Steady-State Kinetics of Cabbage Histidinol Dehydrogenase
Azadeh Kheirloomoom, Jun-ichi Mano, Atsuko Nagai, Atsuko Ogawa, Genji Iwasaki, and Daisaku Ohta 493
- Molecular Cloning of Isoflavone Reductase from Pea (*Pisum sativum* L.): Evidence for a 3R-Isoflavanone Intermediate in (+)-Pisatin Biosynthesis
Nancy L. Paiva, Yuejin Sun, Richard A. Dixon, Hans D. VanEtten, and Geza Hrazdina 501

PROTEIN STRUCTURE AND FUNCTION; PROTEASES, PROTEIN TURNOVER, AND POST-TRANSLATIONAL PROCESSING

- Cleavage of the NH₂-Terminal Octapeptide of *Bothrops asper* Myotoxic Lysine-49 Phospholipase A₂ Reduces Its Membrane-Destabilizing Effect
Cecilia Díaz, Alberto Alape, Bruno Lomonte, Timoteo Olamendi, and José María Gutiérrez 336
- Purification and Physicochemical Characterization of Soyatoxin, a Novel Toxic Protein Isolated from Soybeans (*Glycine max*)
Ilka M. Vasconcelos, Andrea Trentim, Jorge A. Guimarães, and Celia R. Carlini 357
- Sequences of the Iron-Sulfur Protein Precursor Necessary for Its Import and Two-Step Processing in Yeast Mitochondria
Shanker Japa and Diana S. Beattie 414
- The Post-translational Processing of Myeloperoxidase Is Regulated by the Availability of Heme
Inga B. Pinnix, Georgianna S. Guzman, Herbert L. Bonkovsky, Sherif R. Zaki, and Joseph M. Kinkade, Jr. 447
- Purification and Characterization of PAM-1, an Integral Membrane Protein Involved in Peptide Processing
E. Jean Husten and Betty A. Eipper 487
- AUTHOR INDEX FOR VOLUME 312 588

NOTICE

The Subject Index for Volume 312 will appear in the December 1994 issue as part of a cumulative index for the year 1994.



Digitized by the Internet Archive
in 2026

Archives of BIOCHEMISTRY AND BIOPHYSICS is an international journal dedicated to the dissemination of fundamental knowledge in all areas of biochemistry and biophysics. **Research Reports** and **regular manuscripts** that contain new and significant information of general interest to workers in these fields are welcome. Sufficient detail must be included to enable others to repeat the work.

Research Reports provide a mechanism for rapid publication of short but complete manuscripts on outstanding and novel research findings. They should consist of 1000 or fewer words of text and a total of six or fewer figures and tables. The first paragraph should comprise an abstract of the principle findings without abbreviations followed by the background, rationale, and conclusions of the study. Experimental methods should be reported in the table or figure legends, not in the text. Acknowledgments may be included in a footnote to the title. Omit the abstract and text subheadings, and keep literature citations to a reasonable minimum. The scientific quality of these reports should be of the highest caliber to facilitate rapid review. Authors should identify the manuscript as a Research Report and submit it directly to the Editorial Office of the journal (see below).

Accelerated status may also be given to those manuscripts that are reviewed as outstanding and that require little or no revision. At submission, authors may request accelerated publication of their manuscript. To expedite publication of such articles, authors will not receive proofs.

Manuscripts should be written in clear, concise, and grammatical English and should be submitted in quadruplicate (one original and three photocopies), including four sets of original figures or good quality glossy prints, to:

Archives of BIOCHEMISTRY AND BIOPHYSICS

Editorial Office, 525 B Street, Suite 1900
San Diego, California 92101-4495

Failure to receive the required number of copies of the manuscript may delay review. All copies of halftone artwork *must* be glossy prints or originals; photocopies of halftones do not show sufficient detail to be used for the review process. *In the case of rejected manuscripts only one copy of the manuscript will be returned to the author.*

For nucleotide sequence data authors are encouraged to submit original nucleotide or amino acid sequence data to a databank such as GenBank or EMBL. A footnote that includes the accession number should be included on the title page. It is preferable that the sequence data be deposited either prior to submission or by the time of acceptance of the manuscript. However, a footnote can be added at the proof stage if the material is deposited after acceptance. For further information please contact the Editorial Office or GenBank or EMBL directly.

Policy regarding publication of experiments on unanesthetized animals conforms with the standards for use of laboratory animals established by the Institute of Laboratory Animal Resources, U.S. National Academy of Sciences. Experiments in which curariform agents are used must be justified and details of the steps taken to reduce or avoid distress to the animal must be provided, particularly with regard to electrical stimulation.

Original papers only will be considered. ***Manuscripts are accepted for review with the understanding that the same work has not been published, that it is not under consideration for publication elsewhere, and that its submission for publication has been approved by all of the authors and by the institution where the work was carried out. It is the responsibility of the corresponding author to obtain the agreement of all the coauthors of the manuscript prior to its submission to the journal.*** Abstracts of oral or poster presentations are not considered to constitute previous publication. Presentation of material in preliminary communications normally will not preclude publication of a full paper in **Archives**, provided that the full paper contains additional information that justifies its publication and does not repeat the presentation of the same data that supported the preliminary communication. The manuscript should be accompanied by copies of all preliminary communications and of all relevant manuscripts that are in press or under editorial consideration by another journal. Authors must verify the wording of any cited personal communication with the persons who supplied the information and obtain approval for the use of their names in connection with the quoted information or for the citation of unpublished work; written evidence of such approval should accompany the manuscript. All material published in **Archives** represents the opinions of the authors and should not be construed to reflect the opinions of the Editors or the Publisher.

Authors should suggest competent reviewers in their field and may also suggest individuals whom they wish to have excluded from the review process. The corresponding author will receive a decision letter from the Executive Editor. Revised manuscripts and correspondence concerning such manuscripts should be sent to the Executive Editor at the address indicated on the decision letter. Revised manuscripts should be accompanied by a copy of the unrevised version.

Many acceptable papers require minor revision or condensation. It is in the mutual interest of both the authors and the journal that amended manuscripts be returned promptly. A revised paper will retain its original date of receipt only if it is received by the Executive Editor within 2 months of the date of return to the author.

Authors submitting a manuscript do so on the understanding that if it is accepted for publication, copyright in the article, including the right to reproduce the article in all forms and media, shall be assigned exclusively to the Publisher. The Publisher will not refuse any reasonable request by the author for permission to reproduce any of his or her contributions to the journal.

Form of manuscript. Manuscripts should be typewritten and double-spaced throughout on one side of 8½ × 11-in. white paper, with 1-in. margins on all sides. All pages should be numbered consecutively.

¹ An extended Instructions to Authors is published in the January issue of **Archives of BIOCHEMISTRY AND BIOPHYSICS**. Reprints are available from the Editorial Office upon request. Authors should consult the extended Instructions for details on nomenclature, IUPAC-IUBMB rules and recommendations, and accepted abbreviations.

Subject Areas. Authors should specify on page 1 of the manuscript the Subject Area of the article submitted:

Biological Oxidations and P450 Reactions

Glycoconjugates and Oligosaccharides; Proteoglycans and Extracellular Matrices

Lipids, Lipid Mediators, and Glycolipids

Biophysical Chemistry and X-Ray Crystallography

Membrane Proteins and Transport; Intracellular Signals; Cytokines and Receptors

Enzyme Structure and Mechanisms; Cellular Regulation; Phosphorylation and Dephosphorylation

Plant Biochemistry and Molecular Biology

Protein Structure and Function; Proteases, Protein Turnover, and Post-translational Processing

Gene Expression, Transcription, and Translation

Page 1 should contain the article title, author(s), affiliation(s), a short running title (abbreviated form of title) of less than 65 characters including letters and spaces, the appropriate subject category for listing in the Table of Contents, suggestions for index list entries, and the name, complete mailing address, and telephone and fax numbers of the person to whom correspondence should be sent.

Page 2 should contain a short abstract of 50–250 words.

Editorial style should conform to the *Handbook for Authors* (American Chemical Society).

Key words should be listed immediately after the abstract. The following is an example to be employed.

Key Words: thioredoxins; NADP–thioredoxin reductase; *Acetabularia mediterranea*; chloroplasts.

Footnotes to the text should be identified by superscript Arabic numerals and should be typed double-spaced on a separate sheet: footnotes to tables should be identified by superscript lowercase italic letters (^{a,b}, etc.) and placed at the bottom of the table.

Tables should be numbered with Roman numerals and cited consecutively in the text. Each table should be titled and typed double-spaced on a separate sheet. Units must be clearly indicated for each of the entries in the table.

Authors can submit complex tables and mathematical material as camera-ready copy. In this way, they are spared multiple, tedious proofreadings and the chance of error is reduced. Tables submitted as camera-ready copy should be typed single-spaced whenever possible and preferably submitted as 5 × 7-in. glossy prints.

Figures should be cited consecutively in the text by Arabic numerals. Legends should be typed double-spaced on a separate sheet. All figures and illustrations are to be submitted in such form as to permit photographic reproduction without retouching or redrawing. They should be planned to fit the proportion of the printed page ($7\frac{1}{8} \times 9$ in.; column width, $3\frac{1}{2}$ in.) and submitted no larger than $8\frac{1}{2} \times 11$ in. Lettering on drawings should be of professional quality or generated by *high-resolution* computer graphics and should be large enough (10–12 points) to take a reduction of 50–60%. Drawings should be made with black India ink on tracing linen, smooth-surface white paper, or Bristol board. Alternatively, *high-quality* computer graphics may be acceptable. Graph paper, if used, should be ruled in blue. Glossy prints of figures properly prepared are acceptable. Illustrations in color can be accepted only if the authors defray the cost.

Cover photographs. Suggestions for *cover photographs* are welcome. Submit them as slides with $8\frac{1}{2} \times 11$ -in. color or black-

and-white prints to accompany specific articles. A short (one-line) legend should accompany each photograph.

References should be cited in the text by an Arabic numeral in parentheses and listed at the end of the paper in numerical order typed double-spaced on a separate sheet. Abbreviations of journal titles should conform to those of the most recent edition of *Chemical Abstracts Service Source Index*. Please note the following examples.

1. Terry, M. J., Wahleithner, J. A., and Lagarias, J. C. (1993) *Arch. Biochem. Biophys.* **306**, 1–15.
2. Bolander, F. F. (1989) *Molecular Endocrinology*, Academic Press, San Diego.
3. Compton, T. (1990) in *PCR Protocols: A Guide to Methods and Applications* (Innis, M. A., Gelfand, D. H., Sninsky, J. J., and White, T. J., Eds.), pp. 39–45, Academic Press, San Diego.

Miniprint supplements are an effective way of presenting supportive data. They are printed from plates made by photographic reduction from typed pages provided by the author. Types of data that have been published as miniprint supplements include analyses relevant to studies of amino acid or polynucleotide sequences, details of chemical syntheses, preparation of enzymes, extended statistical or mathematical discussions, and X-ray diffraction data. The miniprint supplement is published in the journal, immediately following the parent paper, and is included in the reprints. Since the miniprint supplement is produced from camera-ready copy supplied by the authors with no redaction or editorial changes it is important that the copy be letter perfect and conform to the style of the journal. *Authors will not be permitted to make changes to the miniprint supplement at the proof stage. Any changes necessary in the proof must be made as a typeset "Note added in proof."*

Proofs will be sent to the author, with a reprint order form. Authors will be charged for extensive alterations.

Reprints. Fifty reprints of each article will be provided free of charge. Additional reprints may be purchased.

Personal computer disks. Manuscripts may be submitted to **Archives of BIOCHEMISTRY AND BIOPHYSICS** on personal computer disks after the manuscript has been accepted and after all revisions have been incorporated onto the disk. Label the disk with the type of computer used, the type of software and the version number, and the disk format. All tabular material will be typeset conventionally. Art must be prepared as camera-ready copy; see the section on Figures earlier in these Instructions to Authors.

A hard copy printout of the manuscript that exactly matches the disk file must be supplied. Academic Press will not accept disks without accompanying printouts of all files on the disk. File names must clearly indicate the content of each file. The manuscript will be edited according to the style of the journal, and the proofs must be read carefully by the author. Disks that are not translatable or economical to process will not be used. The publisher reserves the right not to use the disk.

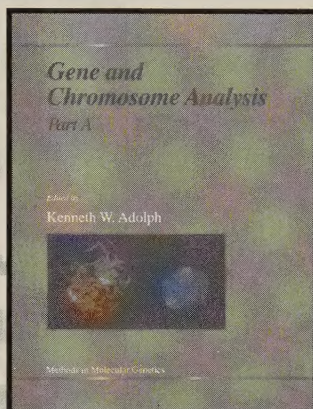
For further information on preparing the disk for typesetting conversion, please contact the publisher (Editorial Supervisor, Journal Division, Academic Press, 525 B Street, Suite 1900, San Diego, California 92101-4495; telephone: (619) 699-6415; fax: (619) 699-6800).

NEW METHODS FOR LIBRARIES AND LABORATORIES.

METHODS IN MOLECULAR GENETICS

Edited by
KENNETH W. ADOLPH

The new series, METHODS IN MOLECULAR GENETICS, will provide experimental procedures for use in the laboratory. Because the introduction of molecular genetic techniques and related methodology has revolutionized biological research, a wide range of methods will be covered. The power and applicability of these techniques have led to detailed molecular answers to important biological questions and have changed the



emphasis of biological research, as well as medical research, from the isolation and characterization of cellular material to studies of genes and their protein products.

METHODS IN MOLECULAR GENETICS will be of value to researchers as well as students and technicians in a number of disciplines because of the wide applicability of the procedures and the topics that will be covered.

VOLUME 1

GENE AND CHROMOSOME ANALYSIS

Part A

KEY FEATURES

- Presents methods for ease of use and ready adaptation to new systems
- Includes comprehensive protocols for:
 - Gene cloning and expression (cDNA cloning methods, cDNA normalization, tissue-specific gene regulation, PCR, and gene transfer)
 - Microcell hybrids (microcell-mediated chromosome transfer)
 - Chromosome mapping (cosmid clones, physical mapping, microsatellite markers, and *in situ* hybridization)
 - DNA-protein interactions (DNA topology and columns and gels to assess DNA-protein interactions)

May 1993, 404 pp., \$85.00/ISBN: 0-12-044301-5

VOLUME 2

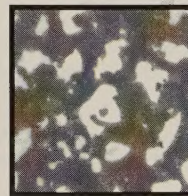
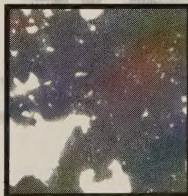
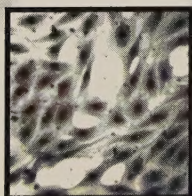
GENE AND CHROMOSOME ANALYSIS

Part B

KEY FEATURES

- Presents methods for ease of use and ready adaptation to new systems
- Includes experimental protocols for:
 - Recombinant DNA (isolation of cDNA clones, generation of recombinant molecules, and improved vectors)
 - Chromosome and DNA analysis (DNA cleavage, extrachromosomal elements, mutations in malignancy, *in situ* hybridization, and pulsed field gels)
 - Immunoglobulin genes (antibody diversity, genetically engineered immunoglobulins, mapping of immunoglobulin genes, and Ig chimeras)
 - Mutation, replication, transcription, translation (mutants and mutagenic activity, DNA replication fidelity, and transcription factors)

September 1993, c. 366 pp., \$85.00 (tentative)/ISBN: 0-12-044303-1



ORDER FROM YOUR LOCAL BOOKSELLER OR DIRECTLY FROM



ACADEMIC PRESS

Order Fulfillment Department **DM17915**
6277 Sea Harbor Drive, Orlando, FL 32887

CALL TOLL FREE **1-800-321-5068**
OR FAX **1-800-336-7377**

Prices subject to change without notice. © 1993 by Academic Press, Inc. All Rights Reserved. LK/CEP/MEH — 27073



Genetic Assimilation

New Companion References from Academic Press

Methods in Molecular Genetics

Edited by

Kenneth W. Adolph

*University of Minnesota Medical School
Minneapolis*

The new series **Methods in Molecular Genetics** provides practical experimental procedures for use in the laboratory. The power and applicability of these procedures have led to detailed, molecular answers to important biological questions, and have changed the emphasis of biological research, as well as medical research, from the isolation and characterization of cellular material to studies of genes and their protein products.

Volume 3

Molecular Microbiology Techniques, Part A

April 1994, c. 400 pp., \$85.00 (tentative)

ISBN: 0-12-044305-8

Volume 2

Gene and Chromosome Analysis, Part B

September 1993, 369 pp., \$85.00

ISBN: 0-12-044303-1

Volume 1

Gene and Chromosome Analysis, Part A

1993, 404 pp., \$85.00

ISBN: 0-12-044301-5

Order from your local bookseller or directly from

ACADEMIC PRESS, INC.

A Division of Harcourt Brace & Company

Order Fulfillment Dept. DM17915

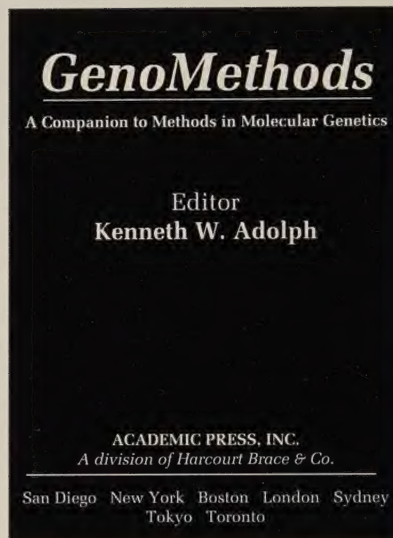
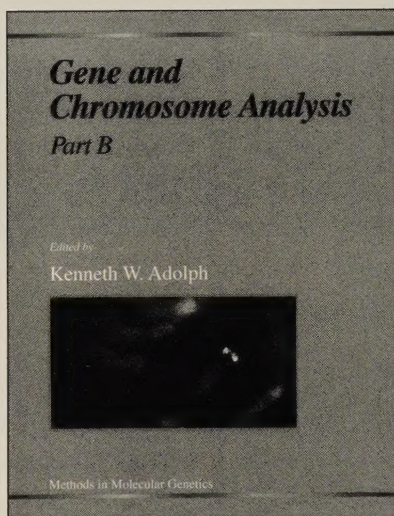
6277 Sea Harbor Drive, Orlando, FL 32887

CALL TOLL FREE

1-800-321-5068

FAX: **1-800-336-7377**

Prices subject to change without notice. © 1994 by Academic Press, Inc. All Rights Reserved.



GenoMethods

A Companion to Methods in Molecular Genetics

Edited by

Kenneth W. Adolph

*University of Minnesota Medical School
Minneapolis*

GenoMethods presents molecular biology and genetics methods as well as related techniques useful to researchers in the most active and significant fields of biomedical and biological research today. Articles in the topical issues of this new journal range from molecular methods for investigating gene structure, regulation, and function, to techniques important in genome and chromosome research.

From fundamental techniques used in molecular biology and genetics to experimental procedures for genome research, **GenoMethods** provides a cutting-edge resource for cutting-edge investigators.

Please contact the Publisher for more information.

Sample copies and privileged personal rates are available upon request. For more information, please write or call:

Academic Press, Inc., Journal Promotions Dept.

525 B Street, Suite 1900

San Diego, CA 92101-4495 U.S.A.

1-800-894-3434

All prices are in U.S. dollars and are subject to change without notice. Canadian customers: Please add 7% Goods and Services Tax to your order.